CLAIMS

1. An immediate release pharmaceutical formulation for oral use containing Diclofenac in acid and/or salt form together with alkali metal bicarbonates or mixtures thereof and customary excipients and adjuvants, wherein said alkali metal bicarbonates are present in amounts of from 20 to 80 % by weight based on the weight of Diclofenac.
2. A formulation according to claim 1 wherein said alkali metal bicarbonates are present in amounts of from 40 to 80 % by weight based on the weight of Diclofenac.
3. A formulation according to claim 1 characterized in that Diclofenac is present in its potassium and/or sodium salt form.
4. A formulation according to claim 3 wherein said alkali metal bicarbonates are potassium and/or sodium bicarbonates.
5. A formulation according to claim 3 which contains from 10 to 60 mg of Diclofenac sodium and/or Diclofenac potassium.
6. A formulation according to claim 1 which contains at least one flavouring substance selected from mint, aniseed and ammonium glycyrrhizinate.
7. A formulation according to claim 6 wherein said at least one flavouring substance is present in pure form in an amount of from 1/5 to 3 times by weight based on the weight of Diclofenac.
8. A pharmaceutical formulation for oral use comprising at least an immediate release layer and at least a delayed release layer, said immediate release layer containing Diclofenac in acid and/or salt form together with alkali metal bicarbonates or mixtures thereof and customary excipients and adjuvants, wherein said alkali metal bicarbonates are present in amounts of from 20 to 80 % by weight based on the weight of Diclofenac.
9. A pharmaceutical formulation according to claim 8 wherein said second delayed release layer also contains Diclofenac as the active principle.

10. A formulation according to claim 8 wherein said alkali metal bicarbonates are present in amounts of from 40 to 80 % by weight based on the weight of Diclofenac.

11. A formulation according to claim 8 characterized in that Diclofenac is present in its potassium and/or sodium salt form.

12. A formulation according to claim 11 wherein said alkali metal bicarbonates are potassium and/or sodium bicarbonates.

13. A method for generating an average C_{max} of Diclofenac comprised between 400 and 2500 ng/ml in human patients in need of such a treatment, which comprises administering to those patients a pharmaceutical formulation containing from 10 to 60 mg of Diclofenac in acid and/or salt form together with alkali metal bicarbonates or mixtures thereof and customary excipients and adjuvants, wherein said alkali metal bicarbonates are present in amounts of from 20 to 80 % by weight based on the weight of Diclofenac.

14. A method according to claim 13 wherein said alkali metal bicarbonates are present in amounts of from 40 to 80 % by weight based on the weight of Diclofenac.

15. A method according to claim 14 wherein said alkali metal bicarbonates are sodium and/or potassium bicarbonates.

16. A method according to claim 14 wherein said average Cmax of Diclofenac is comprised between 1700 and 2300 ng/ml and said pharmaceutical formulation contains about 50 mg of Diclofenac in its potassium and/or sodium salt form.

17. A method according to claim 14 wherein said average Cmax of Diclofenac is comprised between 800 and 900 ng/ml and said pharmaceutical formulation contains about 25 mg of Diclofenac in its potassium and/or sodium salt form.

18. A method according to claim 14 wherein said average Cmax of Diclofenac is comprised between 400 and 500 ng/ml and said pharmaceutical formulation contains about 12.5 mg of Diclofenac in its potassium and/or sodium salt form.

19. A method according to claim 13 wherein said average Cmax of Diclofenac is reached after 13÷27 minutes since administration.

20. A method for obtaining an average T_{max} of Diclofenac after 5÷30 minutes since administration in human patients in need of such a treatment, which comprises administering to those patients a pharmaceutical formulation containing Diclofenac in acid and/or salt form together with alkali metal bicarbonates or mixtures thereof and customary excipients and adjuvants, wherein said alkali metal bicarbonates are present in amounts of from 20 to 80 % by weight based on the weight of Diclofenac.

21. A method according to claim 20 wherein said T_{max} of Diclofenac is reached after 13÷27 minutes since administration.

22. A method according to claim 20 wherein said pharmaceutical formulation contains from 10 to 60 mg of Diclofenac in acid and/or salt form.

23. A method according to claim 22 wherein said alkali metal bicarbonates are present in amounts of from 40 to 80 % by weight based on the weight of Diclofenac.

24. A method according to claim 23 wherein said alkali metal bicarbonates are sodium and/or potassium bicarbonates.

25. A method according to claim 20 wherein said formulation is a pharmaceutical formulation for oral use comprising at least an immediate release layer and at least a delayed release layer, said immediate release layer containing Diclofenac in acid and/or salt form together with alkali metal bicarbonates or mixtures thereof and customary excipients and adjuvants, wherein said alkali metal bicarbonates are present in amounts of from 20 to 80 % by weight based on the weight of Diclofenac.

26. A method according to claim 25 wherein said second delayed release layer also contains Diclofenac as the active principle.

27. A method according to claim 25 wherein said alkali metal bicarbonates are present in amounts of from 40 to 80 % by weight based on the weight of Diclofenac.

28. A method according to claim 27 characterized in that Diclofenac is present in its potassium and/or sodium salt form and said alkali metal bicarbonates are potassium and/or sodium bicarbonates.

TABLE 1

Pharmacokinetic parameters for two different diclofenac formulations: test (Diclofenac potassium salt sachets) and reference (Diclofenac potassium salt sugar coated tablets)

	t_{max} (h)		C_{max} (ng/mL)		$t_{½}$ (h)		AUC_{0-t} (ng•mL^{-1}•h)		$AUC_{0-\infty}$ (ng•mL^{-1}•h)		C_t		$C_{max}/AUC_{0-\infty}$ (h^{-1})		AUC extrapolated (%)	
Vol. no.	Test	Ref.	Test	Ref.	Test	Ref.	Test	Ref.	Test	Ref.	Test	Ref.	Test	Ref.	Test	Ref.
Vol. 1	0.250	0.500	1573.000	1186.211	1.505	0.939	1024.511	885.549	1050.137	910.868	11.800	18.700	1.498	1.302	2.37	0.00
Vol. 2	0.250	4.000	2382.368	965.100	0.875	1.358	1653.124	2092.036	1693.172	2092.036	31.700	13.500	1.407	0.461	1.82	1.38
Vol. 3	0.184	1.000	2614.655	1352.400	0.796	1.610	1687.529	1763.484	1718.755	1788.111	27.200	10.600	1.521	0.756	0.83	1.15
Vol. 4	0.250	3.000	2404.848	735.454	0.996	1.132	1881.944	1834.958	1897.754	1856.346	11.000	13.100	1.267	0.396	1.39	1.88
Vol. 5	0.250	0.500	2971.457	1405.000	1.667	1.903	1819.756	1687.075	1845.486	1719.478	10.700	11.800	1.610	0.817	1.56	1.90
Vol. 6	0.250	0.750	2158.700	1351.500	0.843	0.650	1197.716	1091.996	1216.693	1113.146	15.600	22.500	1.774	1.214	2.50	1.79
Vol. 7	0.250	0.750	1739.200	1741.717	0.596	0.658	1448.713	1301.887	1485.867	1325.661	43.200	25.000	1.170	1.314	1.46	1.78
Vol. 8	0.250	0.500	1715.350	534.300	0.818	1.111	991.864	1126.414	1006.522	1146.775	12.400	12.700	1.704	0.466	3.08	2.75
Vol. 9	0.250	0.750	444.112	747.800	0.787	1.188	669.084	886.300	690.354	911.329	18.700	14.600	0.643	0.821	1.74	1.80
Vol. 10	0.267	0.750	2350.100	1110.400	0.960	1.070	1327.808	1020.286	1351.357	1038.971	17.000	12.100	1.739	1.069	3.01	3.01
Vol. 11	0.167	0.500	1867.200	1465.502	1.141	0.762	1337.821	892.870	1379.311	920.579	25.200	25.200	1.354	1.592	1.62	2.03
Vol. 12	0.167	0.500	4273.026	1432.200	1.052	0.697	1703.655	1139.003	1731.709	1162.638	18.500	23.500	2.468	1.232	1.26	1.56
Vol. 13	0.250	0.500	2097.089	1155.371	1.313	1.198	1486.526	1233.531	1505.454	1253.088	10.000	11.300	1.393	0.922	2.58	2.26
Vol. 14	0.167	0.250	2242.684	967.795	0.997	0.837	987.522	927.726	1013.665	949.163	18.200	17.700	2.212	1.020	1.91	2.86
Vol. 15	0.184	0.500	2040.247	1129.957	0.724	0.804	1213.725	1040.424	1237.399	1071.029	22.700	26.400	1.649	1.055	1.33	1.58
Vol. 16	0.250	0.750	2143.692	818.200	0.560	1.199	1186.603	1250.221	1202.653	1270.280	19.900	11.600	1.782	0.644	4.16	2.80
Vol. 17	0.250	1.500	1527.845	480.900	2.752	1.309	958.821	978.797	1000.433	1006.986	10.500	14.900	1.527	0.478	5.51	2.26
Vol. 18	0.250	1.000	1859.608	666.500	1.630	1.383	1131.413	933.008	1197.411	954.597	28.100	10.800	1.553	0.698	2.57	2.11
Vol. 19	0.250	0.750	1537.508	770.100	1.726	1.137	980.348	906.275	1006.229	925.835	10.400	11.900	1.528	0.832	2.03	2.02
Vol. 20	0.250	0.250	1956.004	655.100	0.853	0.883	1309.289	1036.836	1336.472	1058.242	22.400	16.800	1.464	0.619	1.19	1.07
Vol. 21	0.250	0.500	3551.360	2421.060	1.322	1.233	2147.217	1639.619	2173.030	1657.372	13.500	10.000	1.634	1.461	1.75	1.68
Vol. 22	0.167	0.500	2464.978	1274.648	0.611	0.624	1038.817	816.924	1057.293	830.908	21.000	15.500	2.331	1.534	3.13	1.80
Vol. 23	0.167	0.750	2304.351	453.500	2.066	0.862	1161.414	1049.327	1198.950	1068.588	12.600	15.500	1.922	0.424	2.19	1.94
Vol. 24	0.250	0.500	2901.504	894.337	0.970	1.279	1645.384	1086.512	1682.290	1108.024	26.400	11.700	1.725	0.807	2.10	1.78
Mean	0.228	0.885	2213.370	1071.461	1.148	1.076	1332.942	1192.544	1361.600	1214.169	19.113	15.725	1.620	0.914	2.213	1.883
SD	0.037	0.860	743.099	450.780	0.523	0.320	358.048	350.116	358.359	348.108	8.244	5.160	0.377	0.365	1.035	0.641
CV%	16.300	97.091	33.573	42.072	45.557	29.700	26.862	29.359	26.319	28.671	43.134	32.812	23.277	39.991	46.795	34.056
Min.	0.167	0.250	444.112	453.500	0.560	0.624	669.084	816.924	690.354	830.908	10.000	10.000	0.643	0.396	0.833	0.000
Max.	0.267	4.000	4273.026	2421.060	2.752	1.903	2147.217	2092.036	2173.030	2092.036	43.200	26.400	2.468	1.592	5.512	3.010
Geom. Mean	0.225	0.692	2070.719	987.180	1.056	1.032	1287.195	1150.713	1316.580	1173.325	17.609	15.011	1.573	0.841	2.023	//
Median	0.250	0.625	2151.196	1039.098	0.983	1.122	1261.507	1067.920	1286.936	1089.527	18.350	14.050	1.582	0.827	1.974	1.843